

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Takehito USHIKI; Hitoshi TSUNODA

Serial No: Not Assigned [parent 09/346,004]

Filed: December 11, 2001

For: SEMICONDUCTOR WAFER,  
METHOD FOR PRODUCING THE  
SAME, AND WAFER CHUCK

Art Unit: Not Assigned

Examiner: Not Assigned

**PRELIMINARY AMENDMENT**

Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

Prior to examination of the above-identified divisional application, please  
amend the application as follows:

**IN THE CLAIMS:**

Rewrite claim 14 as follows:

14. (Amended) A method for producing a semiconductor wafer by polishing a surface of the semiconductor wafer which is held at its back surface, which determines a back surface profile and analyzes its frequency at least before holding the semiconductor wafer and polishes a semiconductor wafer having undulation components on wafer back surface of  $10 \mu\text{m}^3$  or less represented in terms of power spectrum density at least for the components at a wavelength of 10 mm and/or a

variation of power spectrum density of 2.0 or less for undulation components at a wavelength of from 3 mm to 20 mm of the wafer back surface.

Please add the following new claims:

--15. The method for producing a semiconductor wafer according to claim 14, which utilizes a semiconductor wafer having wafer warpage of 20  $\mu\text{m}$  or less.

--16. The method for producing a semiconductor wafer according to claim 14, which utilizes a silicon semiconductor wafer.

--17. The method for producing a semiconductor wafer according to claim 15, which utilizes a silicon semiconductor wafer.--

REMARKS

This divisional application is being filed in order to prosecute non-elected claim 14 of parent application Serial Number 09/346,004, filed July 1, 1999. Prior to examination of the divisional application, Applicant is amending claim 14 in the manner set forth above, and is adding new claims 15, 16 and 17, as also set forth above. New claims 15 and 16 each depend from claim 14, while new claim 17 depends from claim 15.

In a first Office Action on the merits, which issued on September 13, 2001 in connection with the parent application, the claims of that application were rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. More specifically, it is stated that the specification lacks a disclosure for calculating the power spectrum density. It is said in the Office Action that the specification provides standards for the frequency analysis, Fourier transformation, and a power equation, but fails to provide the equation or instrument used to calculate the power spectrum density. Claim 14 of the present application also makes reference to power spectrum density.

By way of explanation, a power spectrum density means a power spectrum with respect to a specified frequency or a specified wavelength. Power is determined using equation (2) set forth in the last line of page 15 of the specification. The power

spectrum is obtained by plotting the relation between spatial frequency and the power. Accordingly, the power spectrum density with respect to a specified frequency or a specified wavelength is automatically obtained. For this reason, the specification in its present form has sufficient disclosure for calculating the power spectrum density, to support the recitation of the power spectrum density in the claims.

Also, in the Office Action issued September 13, 2001 in connection with the parent application, the claims are rejected as anticipated by or as obvious over U.S. Patent 5, 447,890 of Kato. Also, certain of the claims are rejected as anticipated by or as obvious over EP 0 764 976 A1. Neither such reference discloses or suggests methods in accordance with the present invention as defined by claims 14-17. Such claims are submitted to clearly distinguish patentably over such references.

Examination and an action on the merits of this divisional application based on this Preliminary Amendment is respectfully requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles telephone number (213) 337-6846 to discuss the steps necessary for placing the application in condition for allowance.

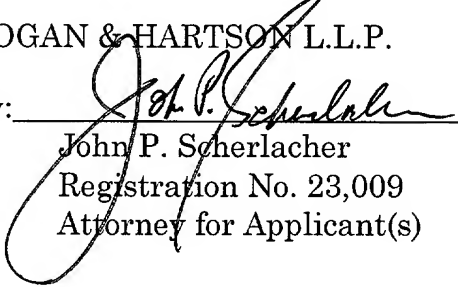
If there are any fees due in connection with the filing of this response, please  
charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,

HOGAN & HARTSON L.L.P.

Date: December 11, 2001

By: \_\_\_\_\_

  
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Version with markings to show changes made:

Rewrite claim 14 as follows:

14. (Amended) A method for producing a semiconductor wafer by polishing a surface of the semiconductor wafer which is held at its back surface, which [utilizes] determines a back surface profile and analyzes its frequency at least before holding the semiconductor wafer and polishes a semiconductor wafer [to be polished] having undulation components on wafer back surface of  $10\ \mu\text{m}^3$  or less represented in terms of power spectrum density at least for the components at a wavelength of 10 mm and/or a variation of power spectrum density of 2.0 or less for undulation components at a wavelength of from 3 mm to 20 mm of the wafer back surface.

Please add the following new claims:

--15. The method for producing a semiconductor wafer according to claim 14, which utilizes a semiconductor wafer having wafer warpage of  $20\ \mu\text{m}$  or less.

--16. The method for producing a semiconductor wafer according to claim 14, which utilizes a silicon semiconductor wafer.

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